

22 October 1956

## MEMORANDUM FOR THE RECORD

SUBJECT: Drilling Committee meeting on 2 October in ED conference room

1. Those persons present at the meeting were [REDACTED]

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2. The present status of the Engineering Division program was described as follows:

PORT BELVOIR (KRD)

Abrasive Blasting - Excellent results were obtained with the abrasive particle blasting gun. A hole ( $\frac{1}{2}$  inch diameter) was obtained in concrete with hard aggregate to a depth of 32 inches with a total blasting time of 50 minutes. The operation was successfully switched from compressor supply to compressed air tanks and this served to emphasize the air supply problem. A standard 120 lbs. airtank (240 ft<sup>3</sup> free air) becomes exhausted in somewhat less than 3 minutes, so one tank is required for approximately one and one half inches. The next step planned is to use tanks of CO because of the advantages of greater storage in the liquid state. [REDACTED] 2 suggested that nitrogen should be efficient for the same reason so that will be tried. It is not expected that the liquified gases will put this unit in the realm of practicality although we want the information for completeness. Unless some solution can be found to the air supply problem, this approach to drilling will remain impractical.

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[REDACTED]  
Abrasive blasting - [REDACTED] work with the abrasive blasting approach has run the gamut from a large commercial unit (produced one inch diameter holes) to the tiny dental drill. They have concluded that the air supply problem makes the abrasive particle approach impractical although possible and so their work along this line has been stopped.

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Silenced drills - [REDACTED] has obtained very significant results with low speed drilling with water flushed, impregnated diamond core drills. At very low speeds on the order of 50 rpm they have drilled at the practical (although not rapid) rate of one-fifth inch per minute with an extremely low noise level (less than 24 lbs). This work may very well provide the answer to the silent drilling requirement.

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[REDACTED]  
Drilling Unit - [REDACTED] has assembled the first prototype of a light-weight drill unit using a direct drive  $\frac{1}{8}$  HP d.c. motor. We asked them to keep the kit under 12 lbs. so some of the drilling rate will be sacrificed for lightweightness compared to their former  $\frac{1}{2}$  HP units. The prototype worked well and was very handy although considerable development is still required.

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DOC 29	REV RATE 23 JULY 80	BY 057447
GRID COMP 056	API 56	TYPE 03
GRID CLASS S	PAGES 2	REV CLASS C
JUST 22	NEXT REV 2000	AUTH. 15

Tension Device- [ ] has been asked for a proposal on a device to provide the high thrust required for masonry drills. This device would be essentially a feeding mechanism and would attach to an expanding plug in the wall.

[ ]  
Facility - All the sample wall sections originally called for are complete including those specified by APD for thickness measurements. [ ] will also evaluate a small ultrasonic drill for use against hardened steel.

3. [ ] described the work of the CD contractors as follows:

[ ]  
 This project is concerned with the measurement of hole depth for masonry and other building materials. The following approaches are being taken:

- a. the use of gamma ray back scattering
- b. the use of neutron back-scattering
- c. the use of ultrasonics

Methods a and b depend upon the intensity of a reflective beam of these radiations as a function of the thickness of the walls.

Tests with gamma radiation thus far have proved disappointing, part of this may be due partially to an improperly designed detector. A new and novel designed detector has been obtained and is now being evaluated. Work involving the back scattering of neutrons is just now being initiated.

Equipment for making ultrasonic measurements has recently been obtained and experiments are now underway. This equipment will permit work at four specific frequencies: 0.4, 1, 5, and 10 megacycles which is broad enough of a range to indicate any trends in absorption, dispersion or reflection as functions of frequencies.

(Shortly after this meeting of the Hole Drilling Committee, reports were received from [ ] of very promising test results with the above depth measurements methods).

[ ]  
 This project has been divided into two objectives: 1) hole drilling thru masonry, and 2) hole drilling thru plaster. The approach to 1) above has been to evaluate the use of fluorine and halogenated fluorides. Work on this phase of the project has been temporarily halted while the effort is placed upon the successful completion of part 2). Part 2) consists of developing an air-abrasive apparatus for penetrating through plaster. A portable prototype is in the final stage of completion and will be delivered to CD for evaluation during the latter part of the month.

[ ]  
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